R E M A R K S

Claims 11-30 are in the case. Claims 13 and 23 have been amended. Support for the amendments to Claims 13 and 23 is found in the Specification at Page 10, lines 19-22.

The withdrawal of the several §112 rejections of the previous Office Action is noted with sincere appreciation.

Acknowledgement of previously submitted IDS

Applicants have not yet received acknowledgement that the Examiner has considered the Information Disclosure Statement submitted on May 9, 2003. It is hereby requested that the Examiner forward such acknowledgement to Applicants at his earliest convenience.

For the convenience of the Examiner, a copy of the Information Disclosure Statement form PTO-1449 filed on May 9, 2003, accompanies this Response. Copies of the references were submitted therewith. However, should the Examiner desire a copy of either or both of the listed references, such copy(ies) will be provided upon request.

Request for Corrected Publication

As mentioned in the previous Response, Page 4 of the present Specification was omitted from the U.S. publication of this application, although Page 4 of the Specification appears on Public PAIR.

A Request for Corrected Publication was filed concurrently with the Response filed on January 8, 2010. This had been advised by the Legal Department at the USPTO, to insure that any patent that issues from this application is printed correctly, even though republication was not being requested.

Marcy Hoefling of Albemarle Corporation, the assignee of the present application, had a telephonic conference with the Examiner on or about January 14, 2010, during which it was indicated that a substitute Specification should be filed, per advice from the Legal Department at the USPTO. The undersigned had a telephonic conference with the Examiner on January 15, 2010, regarding Page 4 of the Specification, and was informed that Page 4 appears in the Image File Wrapper, and that nothing further needs to be done.

If Applicants need to do anything further at this point (such as submit a substitute Specification), please advise.

Rejection under §103(a) over Goodenough et al. in view of Dallmier et al.

Claims 11-30 stand rejected under 35 U.S.C. §103(a) as obvious over Goodenough et al. (U.S. 3,558,503) in view of Dallmier et al. (U.S. 5,683,654). Applicants respectfully request reconsideration of this rejection.

At first glance, both Goodenough et al. and the present case appear to involve mixing of the same chemicals: a diatomic bromine source, sulfamic acid, and a base (and water), as the Office Action recognizes (Page 4, lines 14-15). Results indicate that the contentions in the present Office Action that "the solution in Goodenough would be equivalent to the instant solution in terms of chemical and physical properties" and that "the chemical composition is the same for the prior art and instant invention" (Page 4, lines 9-11 and 15-16) are incorrect.

First, as discussed in Response to the previous Office Action, formation of N-chlorosulfamate is not possible in the solutions of Goodenough et al., and the Examiner was correct regarding the recitation of N-chlorosulfamate in the present claims; the N-chlorosulfamate in the presently claimed solutions is produced inherently. As detailed in the Second Declaration of McKinnie (Exhibit 1073, attached as Appendix A to the Response filed on December 8, 2008), solutions according to the present claims were prepared and tested (paragraphs 4-5). Paragraphs 6-7 of the Second Declaration of McKinnie describe an aqueous biocidal solution formed in accordance with the present claims, which has about 80 mole% N-bromosulfamate and about 20 mole% N-chlorosulfamate, consistent with bromine chloride being an equilibrium mixture of 20 mole% Br_2, 20 mole% Cl_2, and 60 mole% BrCl. In his Second Declaration, McKinnie observes that the results of the DPD tests are the same regardless of the preparation method for the BrCl - preformed or made inline (*i.e.*, immediately prior to addition; paragraph 6). Thus, N-chlorosulfamate is always present in the solutions of the instant claims. The Exhibit numbers in this paragraph refer to Interference No. 105,230, which interference involved the instant application.

Applicants find it tempting to agree with the Examiner that magnesium hydroxide and sodium hydroxide are functionally equivalent, except for the charge difference of the sodium ions and magnesium ions, such that the salts are Mg(sulfamate)$_2$ and Na(sulfamate). The data however, suggest otherwise, at least in the systems under consideration. As observed in the

Declaration of Nalepa filed on August 4, 2009, when used in the same order of addition shown in Example 3, Solution B of Goodenough et al., disparate results were obtained: the *magnesium*-containing solution was *more* stable than the sodium-containing solution. Thus, the teachings of Goodenough indicate that alkali metal bases provide solutions which are inferior for retention of activity. This indicates that the presently claimed solutions do provide unexpected results – significantly higher retention of activity (99% after 4 days at 40°C) while using an alkali metal base; see the Declaration of Nalepa, Table 2, partially reproduced in the Table below.

Furthermore, to make Solution A of Example 3 in Goodenough et al., the base was added to the solution *before* the Br_2 was added. Solution A was found to be less stable than Solution B of the same Example, in which the base was added *after* the Br_2 was added. Clearly, the order of addition of the reagents does affect the properties of the solution produced, and Goodenough et al. teaches that better results are obtained by adding the base later. In other words, Goodenough et al. discourages the addition of base before the halogen, and teaches away from the presently claimed invention, where the base (and a high pH) are present during the bromine chloride addition.

For the convenience of the reader, parts of the Tables of the Declaration of Nalepa are reproduced below. Further recalling the results reported in the Declaration of Nalepa, and alluded to above, Solutions 1 and 2 therein repeated the preparation of Solution B of Example 3 in Goodenough et al., with Solution 2 employing NaOH rather than $Mg(OH)_2$. The amounts of selected reagents and the stability results are reproduced in the table below; full results are in Table 1 of the Declaration of Nalepa submitted on August 4, 2009. The activities of Solutions 1, 2, and 3 were measured initially and after storage for 4 days at 40°C. The activities for all three solutions are shown in the Table below.

TABLE

Reagent or Property	Solution 1 Goodenough	Solution 2 Goodenough modified	Solution 3 present case
Halogen	5.00 g Br_2	5.01 g Br_2	56.75 g BrCl

Hydroxide	$Mg(OH)_2$	NaOH	NaOH
Total wt. of soln.	500.00 g	500.01 g	500.03 g
Moles of OH^-	0.125	0.125	2.025
pH of soln.	8.75	11.55	13.47
Initial activity	9560 ppm Br_2	9610 ppm Br_2	149,000 ppm Br_2
Activity after 4 days	9290 ppm Br_2	6600 ppm Br_2	150,000 ppm Br_2
Activity retained	97%	69%	99%

Claims 13 and 23 as amended recite an active halogen content of about 120,000 ppm to 180,000 ppm. These claims further distinguish over Goodenough et al., which teaches an upper limit of 100,000 ppm, as the Examiner has observed (Office Action, Page 4, lines 5-6). Nothing in Goodenough et al. teaches or suggests the possibility or desirability of such high concentrations of active bromine.

The other reference cited in this rejection, Dallmier et al., solves the problem of the handling issues and corrosive nature of diatomic halogens (such as BrCl and Br_2) by avoiding their use altogether. Instead, Dallmier et al. employs a hypochlorite salt and a bromide ion source (column 3, lines 59-61); the bromide source is typically a bromide salt, usually an alkali metal bromide salt (column 4, lines 33-36). Thus there is no reason for one of ordinary skill in the art to combine Dallmier et al. with Goodenough et al.

> Further, the order of addition in Dallmier et al. is:
> solution of alkali or alkaline earth metal hypochlorite + water soluble bromide ion source;
> time for the bromide ion source and the alkali or alkaline earth metal hypochlorite to react to form a solution of unstabilized alkali or alkaline earth metal hypobromite; and
> solution of an alkali metal sulfamate.

(column 3, line 59, to column 4, line 6). For completeness, it is mentioned that all solutions in Dallmier et al. are aqueous, and various details (*e.g.*, temperature) have been omitted for the sake of clarity. This order of addition is taught to be important: "it is apparent that the

order of addition in the process of manufacture is **critical**" (Dallmier et al., column 6, lines 33-36, emphasis added). Regarding the addition of base, the only disclosure in Dallmier et al. appears in the Example 1 (column 7, lines 63-65), where the base was used to form the alkali metal sulfamate. Thus, in Dallmier et al. teaches the addition of base after the halogen source(s) is present in the solution, consonant with the better results achieved by Goodenough et al. when adding base after adding the bromine.

Applicants respectfully request reconsideration and withdrawal of this rejection in light of the above amendments and remarks.

If any matters remain that require further consideration, the Examiner is requested to telephone the undersigned at the number given below so that such matters may be discussed, and if possible, promptly resolved.

Please continue to address all correspondence in this Application to Albemarle Corporation, at the address of record.

Respectfully submitted,

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